REMARKS

Claims 1-3 are presently pending in the application.

Claim 1 has been amended to incorporate the phosphorus and sulfur contents from claim 2. Claims 1 and 2 have been amended to recite "salts of phosphites obtained by reacting monophosphites and disphosphites...," which is supported in the specification at least in paragraph [0034] of the application publication. No new matter has been added by these amendments, and entry is respectfully requested.

In the Office Action, the Examiner has rejected claims 1-3 under 35 U.S.C. § 112, first paragraph, as lacking support in the specification. In view of the amendment to claims 1 and 2 to recite "monophosphites and diphosphites," which the Examiner acknowledges is supported in the specification, reconsideration and withdrawal of the § 112 rejection are respectfully requested.

In the Office Action, the Examiner has further rejected claims 1-3 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0000866 of Cain ("Cain") in view of U.S. Patent Application Publication No. 2002/0082176 of Chambard et al. ("Chambard), U.S. Patent Application Publication No. 2001/0044389 of Komiya et al. ("Komiya") and U.S. Patent No. 4,169,799 of Sung et al. ("Sung"). The Examiner maintains that Cain discloses a lubricating oil for transmissions comprising a mineral base oil having a kinematic viscosity of about 3.0 to about 7.5 cSt at 100°C and a phosphorus compound, such as dialkylthiophosphate and trialkylphosphate. These compounds are allegedly present in the composition from about 0.1 wt% to about 10 wt% so that the amount of phosphorus based on the total mass of the composition allegedly overlaps the claimed range. The Examiner further argues that Cain teaches a polymethacrylate viscosity index improver having a molecular weight of about 800 to about 6000, which improver is added to the composition in an amount of about 3 wt% to about 40 wt%, allegedly sufficient to raise the kinematic viscosity of the composition to about 5.0 to 6.0 mm^2/s at 100°C absent evidence to the contrary.

Finally, Cain allegedly further teaches a dithiocarbamate compound in an amount such that sulfur is less than 0.15 percent by mass based on the total composition. The Examiner

argues that it is taught in the present application that both dithiocarbamates and thiadiazoles are suitable in lubricating compositions, and that substituting the dithiocarbamate of Cain for a thiadiazole would have been obvious. Further, the Examiner cites Chambard as teaching that both thiadiazoles and dithiocarbamates are well known antiwear agents that may be substituted for each other.

The Examiner acknowledges that Cain does not specifically disclose the %Cp of the oil. However, the Examiner again takes the position that the transmission oils disclosed by Cain and Komiya display the same characteristics and that it would have been obvious for the transmission oil composition disclosed by Cain to comprise a base mineral oil having a %Cp of 75-81, as taught by Komiya, for enhancing low temperature fluidity.

Finally, the Examiner cites Sung as teaching that alkaline earth metal sulfonates are well known in the art as sulfonate detergents for use in lubricating compositions. Accordingly, the Examiner concludes that it would have been obvious to utilize an alkaline earth metal sulfonate as the sulfonate detergent in the Cain composition. Applicants respectfully traverse this rejection and the arguments in support thereof for the reasons set forth previously on the record, which Applicants rely upon in full, and for the additional reasons that follow, and respectfully request reconsideration and withdrawal of the rejection.

As previously explained on the record, the purpose of the presently claimed invention is to provide low viscosity transmission lubricating oil compositions which can enhance fuel efficiency and improve the durability of gears and the shifting properties of wet clutches, including long-lasting shifting properties. Applicants have developed the presently claimed low viscosity, low sulfur compositions by adding appropriate amounts of (B) a specific phosphorus compound in an amount of 0.03 to 0.035 % as P, (C) a viscosity index improver comprising a non-dispersion type polymethacrylate (PMA) having a number average molecular weight of from 5,000 to 35,000, (D) a sulfur-containing compound which is at least one compound selected from the group consisting of thiazole compounds, thiadiazole compounds, and sulfurized ester compounds, as well as a calcium sulfonate, to (A) a specific mineral lubricating base oil having a kinematic viscosity of 2.3 to 3.4 mm^2/s or of 2.5 to 3.3 mm^2/s at 100°C and a %Cp of not less than 70 or of 73 to 82. In the presently claimed composition, sulfur is contained in an amount of 0.05 to 0.14 percent by mass.

Cain teaches mineral oil based gear oils and transmissions fluids which comprise a lubricant basestock and at least one functional additive. The lubricant basestock comprises a specific mineral oil and a specified proportion of aliphatic saturates. The lubricating oils may additionally contain (A) at least one polymer, (B) at least one fluidizing agent, (C) at least one antiwear or extreme pressure agent such as a sulfur compound, phosphorus-containing compound, and/or boron-containing compound, and (D) at least one antioxidant. Neither Cain nor the proposed combination with Chambard, Komiya, and Sung teaches or suggests the claimed amount of component (B) or the claimed sulfur content of 0.05 to 0.14 mass % as follows.

The presently claimed lubricating oil composition contains a phosphorus compound (B) in an amount of 0.03 to 0.035 % by mass in terms of phosphorus. In paragraph [0099], Cain teaches that a phosphorus compound may be included in an amount of about 0.01% to about 10%. Cain narrows this very broad range to preferred amounts of about 0.05% to about 4%, about 0.08% to about 3%, and about 0.1 to about 2%. Accordingly, one skilled in the art selecting an appropriate phosphorus amount based on Cain would have been motivated to select an amount in the preferred range of about 0.1 to about 2%, and certainly not below the lowest preferred amount of 0.05%. This is supported by the Examples of Cain, which contain phosphorus contents within Cain's most preferred range of about 0.1 to about 2%. For example, as shown in paragraph [0242] of Cain, Examples 6-10 contain considerable amounts (1.2 to 1.3 % by weight) of Product of Ex. P-3, which contains 10.2 % by weight phosphorus (paragraph [0138]), resulting in phosphorus contents of 0.12 to 0.13%.

Accordingly, even one skilled in the art would not have been motivated by the teaching of Cain include a phosphorus component in the narrow low range of **0.03 to 0.035% by mass**. Further, there is no teaching or suggestion in Cain (or the secondary references) that such a phosphorus content would enhance the extreme pressure properties and the durability of shifting properties.

Further, the advantageous effects achieved by including the claimed amount of Component (B) would not have been expected based on Cain or the proposed combination with

the secondary references. The following Table includes data from the Rule 132 Declaration filed on July 5, 2007 (Reference Examples 1 and 2) and from Tables 1 and 2 of the present application (Comparative Examples 3 and 4 and Inventive Example 3).

Properties of Lubricating Oil Compositions

		Phosphorus Content				Sulfur Content
		Comparative Example 4	Inventive Example 3	Reference Example 1	Reference Example 2	Comparative Example 3
Component (A)						
Base Oil 1	Mass %	63.7	63.6	63.6	63.3	63.3
Base oil 2	Mass %	12.7	12.7	12.7	12.7	12.7
Base Oil 3	Mass %	8.5	8.5	8.5	8.5	8.5
Kinematic Viscosity of Component (A)	mm^2/s	3.0	3.0	3.0	3.0	3.0
%Cp of Component (A)		73	73	73	73	73
Component (B)						
Phosphorus Additive	Mass %	0.1	0.2	0.26	0.4	0.2
Phosphorus Content in Composition	Mass %	0.02	0.03	0.04	0.06	0.03
Sulfur Content in Component (B)	Mass %	0	0	0	0	0.078
Component (C)						
Viscosity Index Improver (C-1)	Mass %	10.7	10.7	10.7	10.7	10.7
Kinematic Viscosity of Composition	mm^2/s	5.5	5.5	5.5	5.5	5.5
Sulfur Content in composition	Mass %	0.07	0.08	0.08	0.08	0.16
SAE No. 2 Test						
Friction Coefficient After 500 cycles		0.11	0.12	0.13	0.13	0.12
Friction Coefficient After 2,500 cycles		0.11	0.11	0.11	0.10	0.09
Last Non-Seizure Load	N	392	618	618	618	785

It can be seen that the compositions of Comparative Example 4 and Reference Examples 1 and 2, in which the phosphorus contents fall outside of the claimed range of 0.03 to 0.035 mass %, exhibited inferior results relative to the composition of Inventive Example 3 (having a phosphorus content within the claimed range) in the SAE No. 2 Test and the Last Non-Seizure Load Test. Accordingly, the claimed phosphorus content of **0.03 to 0.035 mass %** is critical to providing the properties exhibited by the presently claimed composition.

The presently claimed composition contains sulfur in an amount of 0.05% to 0.14 mass %. As shown in the above Table, the composition of Comparative Example 3, in which the sulfur content (0.16 mass %) is outside of the claimed range, was dramatically inferior to the composition of Inventive Example 3 (all other parameters being identical) in both the SAE No. 2 Test and the Last Non-Seizure Load Test. Such results would not have been expected based on Cain (alone or in combination with the secondary references), which does not recognize the criticality of the sulfur content on the extreme pressure and shifting properties. Accordingly, there would have been no motivation based on Cain to adjust the phosphorus and sulfur contents of the Cain composition (modified by Chambard, Komiya, and Sung) to the claimed range or to expect that such a modification of the phosphorus and sulfur contents would have a favorable effect on the performance of EP properties and the durability of shifting properties.

In paragraph [0056], Cain teaches including an antiwear or EP agent (such as a sulfur compound) in an amount of about 0.05 to about 10 %, about 0.1 to about 8%, about 0.03 to about 7 %, or about 0.5 to about 5%, or, in another embodiment, in an amount of about 0.5 to about 10%, preferably about 1 to about 7%, more preferably about 2% to about 6%. Accordingly, one skilled in the art selecting an appropriate sulfur amount based on Cain would have been motivated to select an amount in the preferred range of about 0.5 to about 5% or about 2 to about 6%, and certainly not in the low claimed range of **0.05 to 0.14 mass %**.

The Examiner argues that Cain teaches that the composition "may" contain as additives, an amine antioxidant, a dithiocarbamate antioxidant, and a sulfur-containing antioxidant which all contain sulfur, thus also teaching an embodiment when the additives are not present. However, there would have been no motivation based on Cain to reduce or eliminate such sulfur-containing compounds in order to achieve a particular sulfur level, nor would the results exhibited by such a sulfur level have been expected based on Cain or the proposed combination with the secondary references which are silent as to the effects of phosphorus and sulfur contents on EP properties.

Additionally, the Examiner argues that it would have been obvious to include calcium sulfonate, as taught by Sung, and a thiadiazole, as taught by Chambard, in the Cain composition.

Because Cain does not teach the desirability of a low sulfur content, there would have been no motivation to control the amounts of these sulfur-containing components, as well as any other sulfur-containing components (such as antioxidants), to achieve the claimed sulfur level of 0.05 to 0.14 mass %.

For at least these reasons, Cain does not teach or suggest all of the claimed elements, including the sulfur and phosphorus content. Further, even modification of the Cain composition to include the mineral oil of Komiya, the sulfur-content of Chambard, and the alkaline earth metal sulfonate of Sung, as suggested by the Examiner, would still not result in a composition containing the claimed components and properties because neither secondary reference teaches the claimed sulfur or phosphorus content. Accordingly, even the proposed combination of references would not teach or suggest all of the claimed elements, and reconsideration and withdrawal of the § 103(a) rejection based on Cain in view of Chambard, Komiya and Sung are respectfully requested.

In view of the preceding Amendment and Remarks, it is respectfully submitted that the pending claims are in full compliance with § 112, patentably distinct from the prior art of record and in condition for allowance. A Notice of Allowance is respectfully requested.

Respectfully submitted,

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